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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

WOZNIAK, JAMES S

ART UNIT

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2626

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/019,125	Applicant(s) ASANO ET AL.	
	Examiner JAMES S. WOZNAK	Art Unit 2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 September 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 May 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. In response to the office action from 9/11/2008, the applicant has submitted a Request for Continued Examination, filed 9/17/2008, amending independent claims 1 and 8-9 to specify that the candidate second words are selected not based on the acoustic score and have unstable acoustic characteristic values with a number of phonemes less than a preset value, while arguing to traverse the art rejection based on this added limitation (*Amendment, Pages 9-11*). The applicant's arguments have been fully considered but are moot with respect to the new grounds of rejection in view of Doyle ("*Progressive Word Hypothesis Reduction for Very Large Vocabulary Continuous Speech Recognition*," 1997).

Claim Objections

2. **Claims 2-4** are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 2 specifies that a number of phonemes is the non-acoustic candidate measure, which is already recited in claim 1, while claims 3-4 recites different alternative measures for candidate selection when the number of phonemes has already been set forth as the measure used in claim 1. Thus, these claims fail to further limit their parent claims.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claim 1-2 and 7-8** are rejected under 35 U.S.C. 103(a) as being unpatentable over Higgins et al (*U.S. Patent: 5,218,668*) in view of Doyle (*"Progressive Word Hypothesis Reduction for Very Large Vocabulary Continuous Speech Recognition," 1997*).

With respect to **Claims 1 and 8**, Higgins discloses:

Extraction means for extracting characteristic values of said input speech, the input speech comprising a plurality of input words (*speech parameter extraction, Col. 5, Lines 45-63; and input speech corresponding to a word sequence, Col. 6, Lines 16-46*);

Selection means for selecting one or more candidate first words from the plurality of input words to be processed by speech recognition processing, based on a word score that represents an evaluation of acoustic scores and language scores calculated using said characteristic values (*determining a first word hypothesis set based on a matching algorithm utilizing a keyword template, Col. 4, Lines 49-66; Col. 6, Lines 16-46; and syntax language models, Col. 8, Lines 18-26*), and for selecting one or more candidate second words from the plurality of input words based on a second measure different from said first measure (*determining a second word hypothesis set based on a matching algorithm utilizing a filler template relating to keywords, Col. 4, Lines 49-66; and Col. 6, Lines 16-46*);

Score calculation means for calculating said score of said candidate first and candidate second words selected by said selection means referencing concatenation information of said first and second words (*scoring a template string from a concatenation of partial strings of existing candidates located in a phrase buffer with current template candidates, Col. 6, Lines 16-46; and Col. 8, Line 9- Col. 9, Line 65*); and

Finalizing means for finalizing a words string, as the recognition result of said speech based on said score (*finalized recognition output corresponding to a string of most likely word templates, Col. 6, Lines 63-67; and finalizing phrase recognition, Col. 9, Lines 26-54*), wherein the word concatenation information is sequentially updated based on the score (*accumulating scores for partial strings by further concatenating candidates for a current frame to the existing partial strings to produce an updated score, Col. 6, Lines 16-46*).

Although Higgins teaches the selection of alternative speech recognition candidates corresponding to smaller speech units, Higgins utilizes an acoustic distance algorithm in order to make such a selection and not a non-acoustic selection of candidate words having unstable acoustic characteristic values with a number of phonemes less than a preset value. Doyle, however, teaches the automatic selection of candidate words having acoustically unstable constituents (*i.e., the shortness of the word contributes to acoustic matching inaccuracy because missing phonemes are more costly*) from a defined set of short words having a low number of phonemes (*i.e., the word "the" consisting of 2 phonemes and see short word list, Section 4.11, Pages 39-40*) based on an assigned boosting amount, without which the short words would not be selected or missed as candidates (*Section 4.11, Pages 37-40*).

Higgins and Doyle are analogous art because they are from a similar field of endeavor in speech recognition. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Higgins with the short word selection means taught by Doyle in order to prevent short words from being lost from consideration in a speech recognition process (*Doyle, Section 4.11, Page 37*).

With respect to **Claim 2**, Doyle further discloses:

A means for a non-acoustic ranking and selection of phoneme recognition candidates in a word through a phoneme misrecognition count (*short word selection is based upon words with a small number of phonemes, Section 4.11, Pages 37-40*).

With respect to **Claim 7**, Higgins recites:

The selection means calculates said score using characteristic values of the speech to select said first word based on said score (*extracted speech parameters used in keyword template matching, Col. 5, Lines 45-63; and Col. 6, Lines 16-21*).

5. **Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over Higgins et al in view of Doyle and further in view of Chiang et al ("*On Jointly Learning the Parameters in a Character-Synchronous Integrated Speech and Language Model*," 1996).

With respect to **Claim 3**, Higgins in view of Doyle teaches the speech recognition system utilizing keyword and alternative model matching to generate candidate hypotheses in recognizing an input speech sequence, as applied to claim 1. Higgins in view of Doyle does not teach the use of an alternative hypothesis scoring means related to related to a part-of-speech,

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however Chiang teaches an HMM based recognizer that utilizes part-of-speech tags in scoring to determine a best recognition hypothesis (*Page 168, Fig. 1*).

Higgins, Doyle, and Chiang are analogous art because they are from a similar field of endeavor in speech recognition. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Higgins in view of Doyle with the scoring means related to a part-of-speech tag as taught by Chiang in order to achieve an alternative recognition measure having an improved recognition rate and a reduced error rate (*Chiang, Page 168*).

6. **Claims 4 and 9** are rejected under 35 U.S.C. 103(a) as being unpatentable over Higgins et al in view of Doyle and further in view of Franz et al (*U.S. Patent: 6,178,401*).

With respect to **Claim 4**, Higgins in view of Doyle teaches the speech recognition system utilizing keyword and alternative model matching to generate candidate hypotheses in recognizing an input speech sequence, as applied to claim 1. Higgins in view of Doyle does not teach the use of an alternative hypothesis scoring means related to a linguistic likelihood, however Franz discloses the use of a language model that determines a score based on linguistics (*Col. 6, Line 42- Col. 7, Line 6*).

Higgins, Doyle, and Franz are analogous art because they are from a similar field of endeavor in speech recognition. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Higgins in view of Doyle with the scoring means related to a linguistic likelihood as taught by Franz in order to provide an

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alternative recognition means that enhances the probability of selecting a correct recognition candidate (*Franz, Col. 6, Line 61- Col. 7, Line 6*).

With respect to **Claim 9**, Higgins in view of Doyle teaches the speech recognition method, as applied to claim 8, while Franz further recites implementing a speech recognition method as a program stored on a computer readable medium to enable method implementation on one or more general purpose computers (*Col. 2, Lines 42-67*).

7. **Claims 5-6** are rejected under 35 U.S.C. 103(a) as being unpatentable over Higgins in view of Doyle and further in view of Holt et al (*U.S. Patent: 5,960,447*).

With respect to **Claim 5**, Higgins in view of Doyle teaches the speech recognition system utilizing keyword and alternative model matching to generate candidate hypotheses in recognizing an input speech sequence, as applied to claim 1. Higgins in view of Doyle does not teach the use of a storage means for memorizing speech recognition results and using the results in a subsequent alternative recognition, however Holt discloses a means for storing a confidence score from a recognition engine for use in a speech recognition process (*Col. 9, Lines 7-61*).

Higgins, Doyle, and Holt are analogous art because they are from a similar field of endeavor in speech recognition. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Higgins in view of Doyle with the confidence score storage means taught by Holt in order to provide an improved alternative speech recognition means for editing and correcting speech recognition results (*Holt, Col. 1, Line 65- Col. 2, Line 21*).

With respect to **Claim 6**, Holt further recites:

Inputting means for providing an input for correcting the results of speech recognition; wherein said storage means stores the results of the speech recognition corrected by the input from said inputting means (*editing a recognition result and updating a confidence score, Col. 9, Lines 36-61*).

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Quinton ("*A Syntactic Analyzer Adapted to Speech Recognition*," 1976)- teaches the non-acoustic selection of short words less than two phonemes (*Page 455, column 1*).

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James S. Wozniak whose telephone number is (571) 272-7632. The examiner can normally be reached on M-Th, 7:30-5:00, F, 7:30-4, Off Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached at (571) 272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/James S. Wozniak/
Patent Examiner, Art Unit 2626